

Figure 1. An example cyclic DC voltammogram scan dq21b26, ch2 for CUBATH® ViaForm™ (Enthone) copper plating bath.

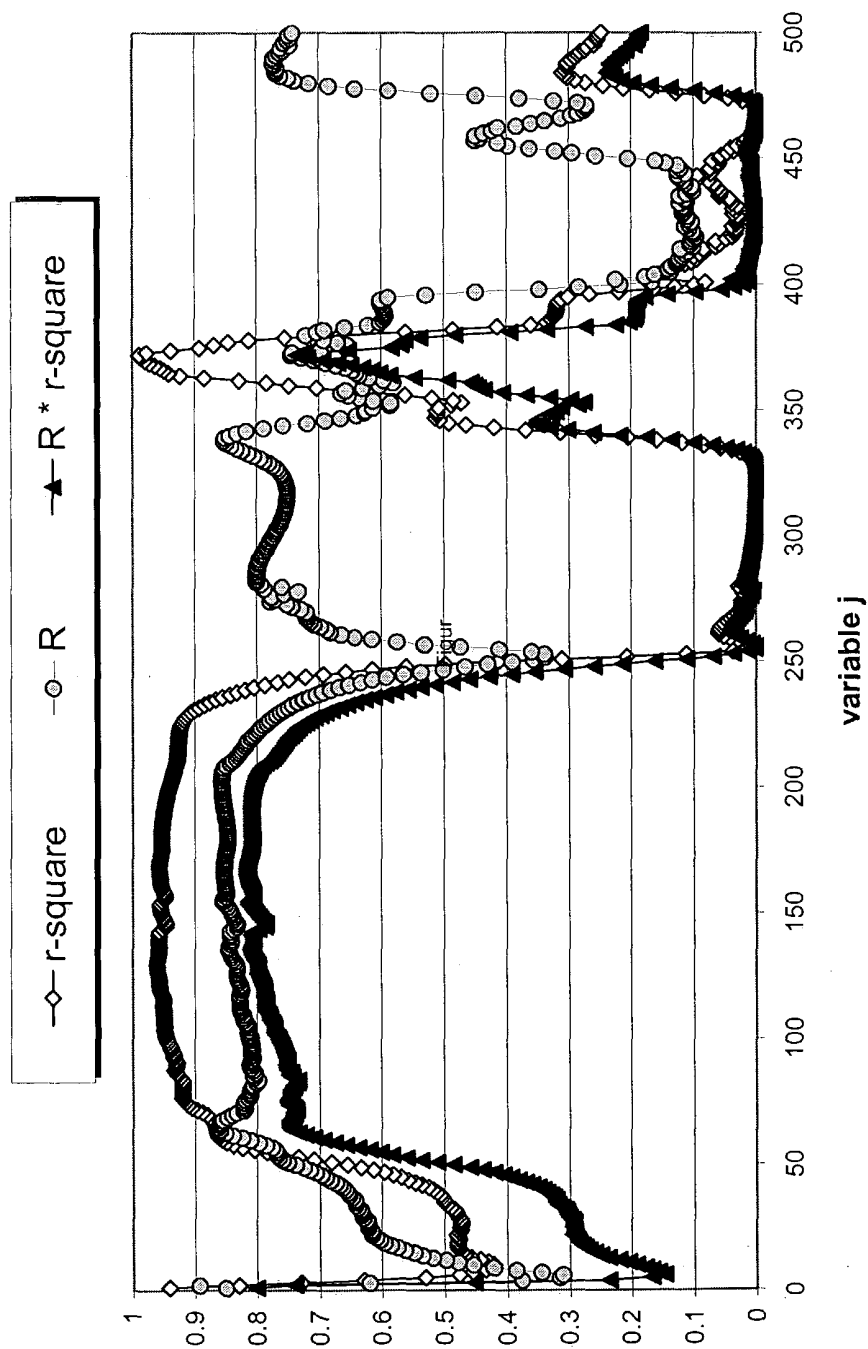


Figure 2.

The squared correlation coefficients (Equation 7),  $r^2$ , for selfpredicted autoscaled tin concentrations obtained via least squares regression for each point of the voltammogram, variable j, (scan dq21x10, channel 2). The modeling power (Equation 11),  $R$ , calculated for same data.

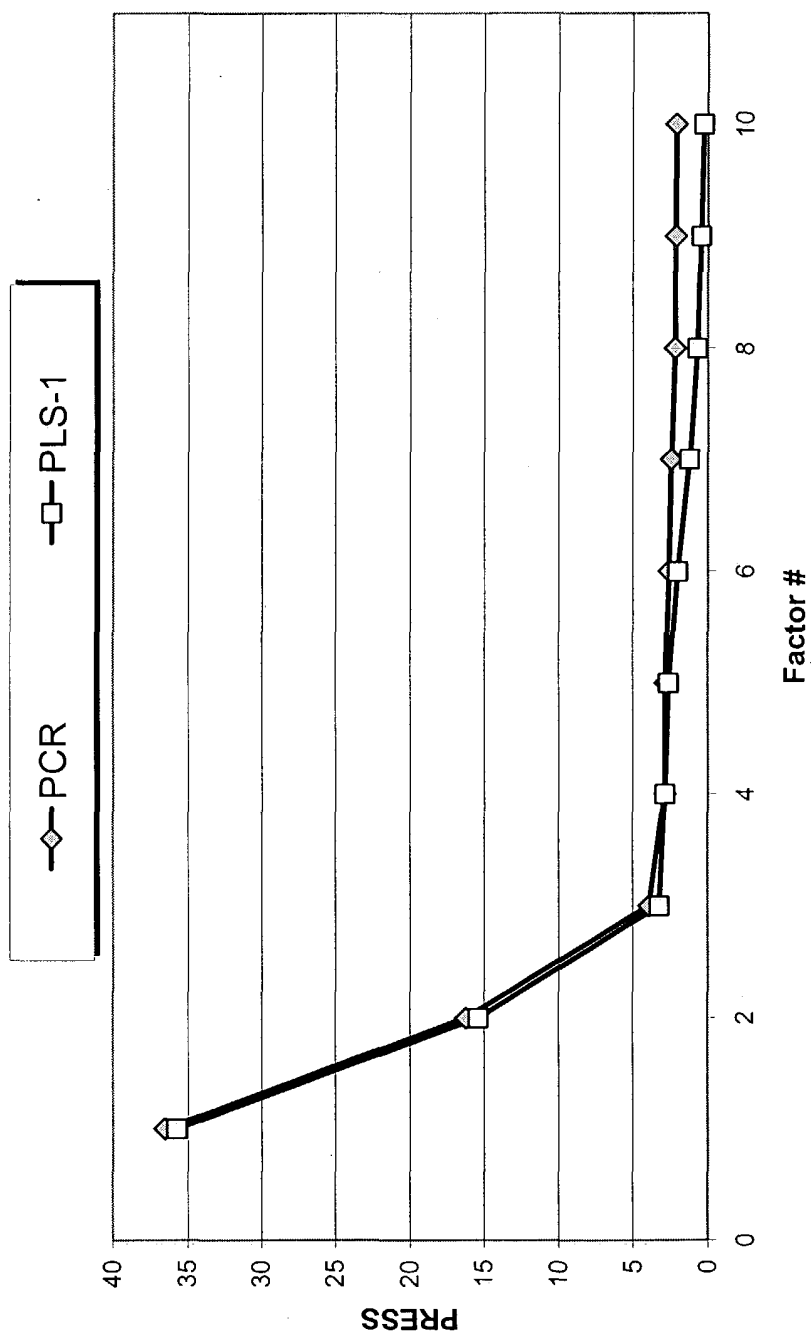


Figure 3a. PRESS (Equation 25) calculated for various number of factors for selfpredicted by PCR and PLS-1 for brightener concentrations (scan dq21cu, channel 2, range 670-765).

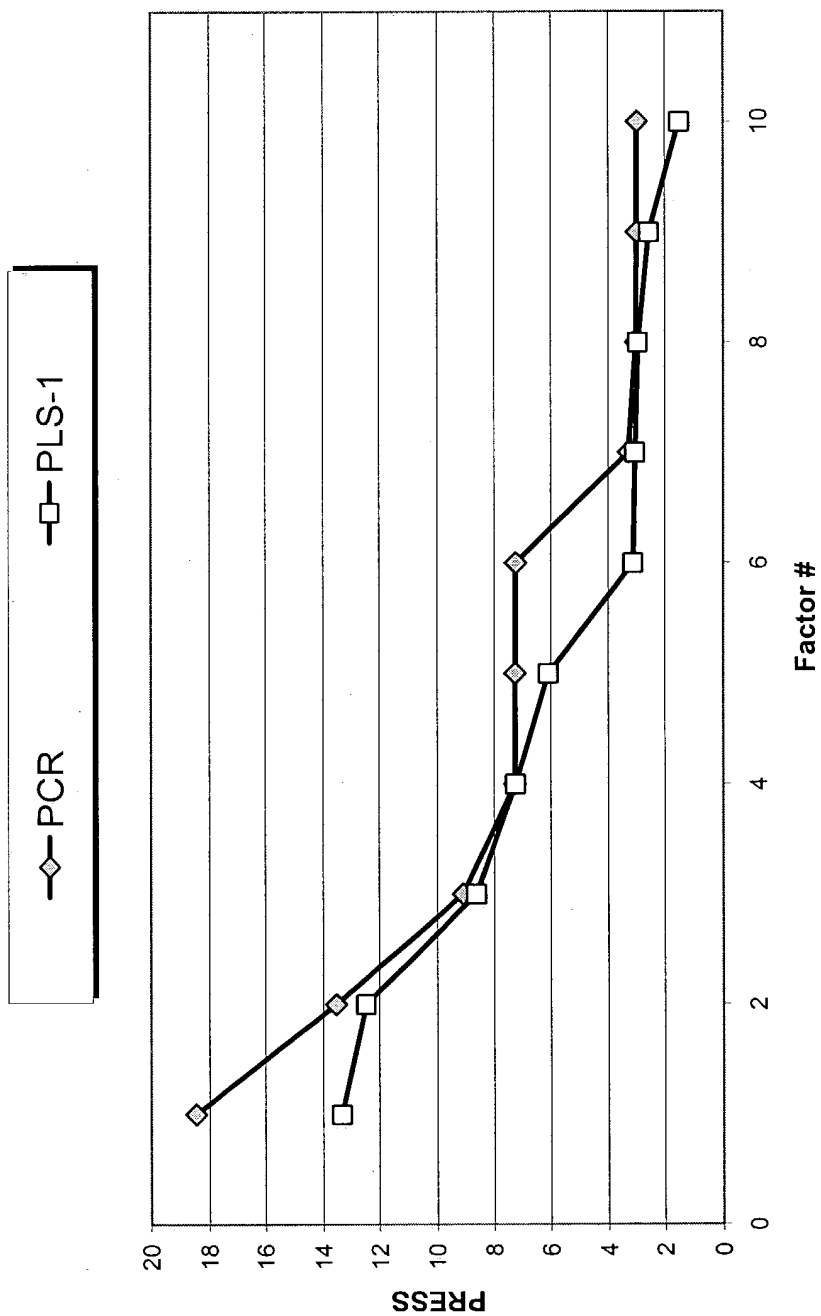


Figure 3b PRESS (Equation 25) calculated for various number of factors for selfpredicted by PCR and PLS-1 carrier concentrations (scan dq21s4, ch 5, range 440-470).

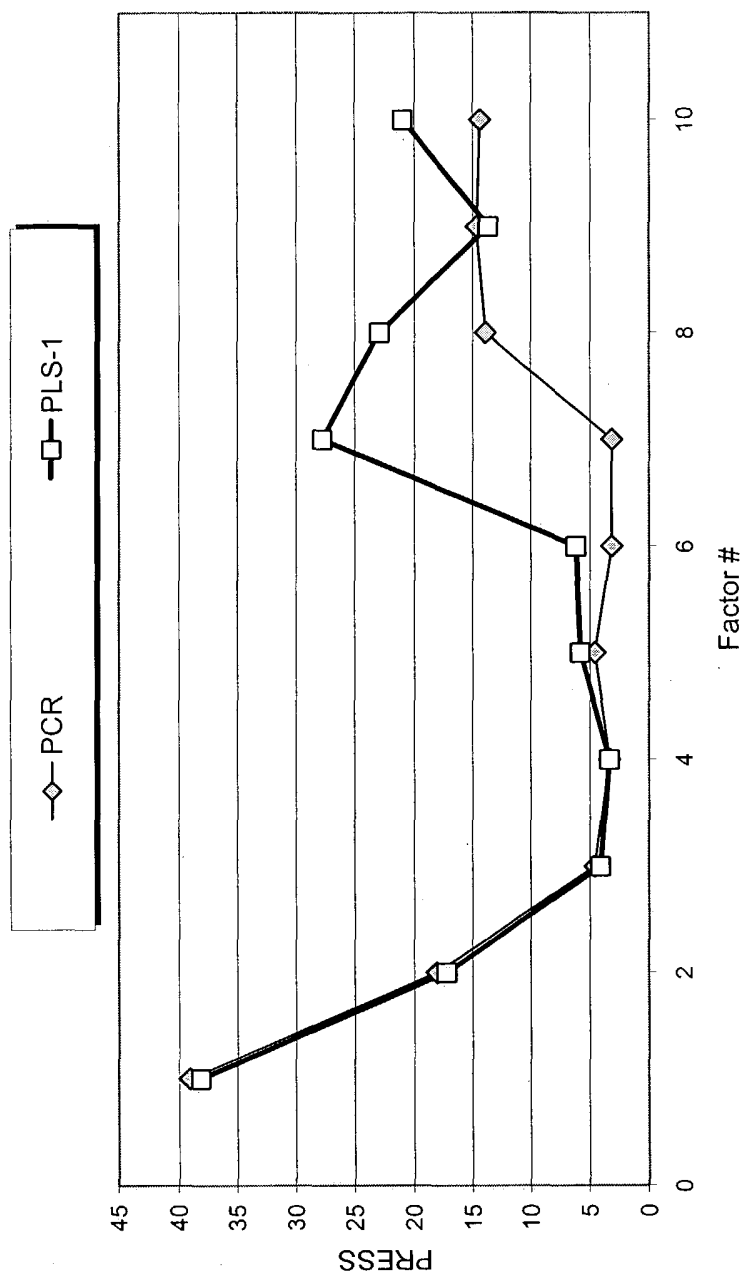


Figure 4a PRESS (Equation 25) calculated for various number of factors for cross-validated by PCR and PLS-1 brightener concentrations (scan dq21cu, channel 2, range 670-765).

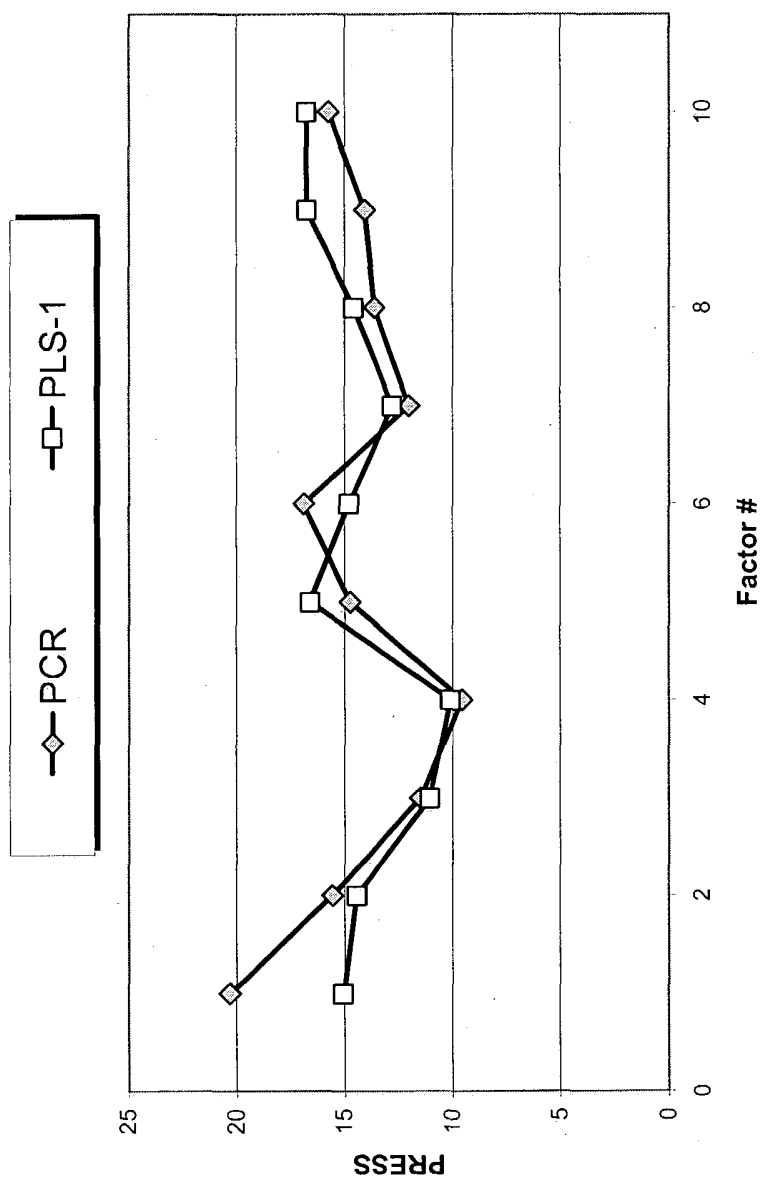


Figure 4b PRESS (Equation 25) calculated for various number of factors for cross-validated by PCR and PLS-1 carrier concentrations (scan dq21s4, ch 5, range 440-470).

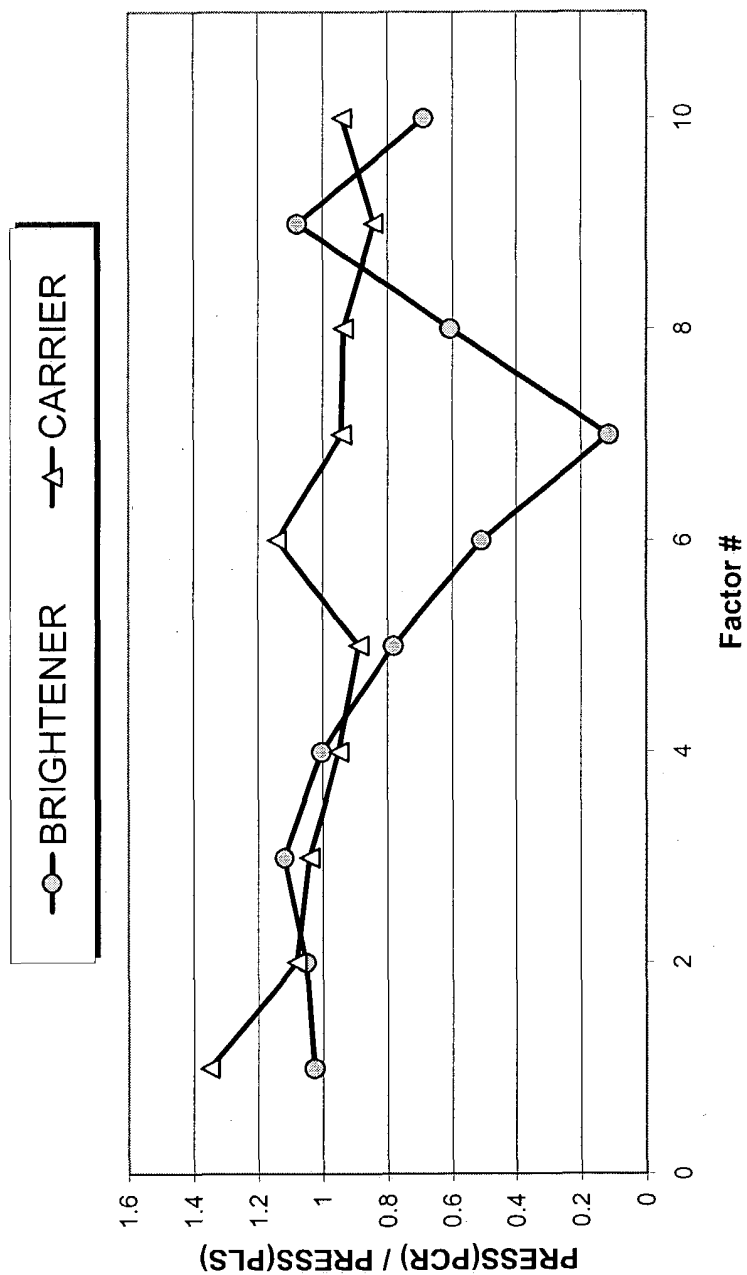


Figure 5  $F_{PRESS}$  (Equation 28) calculated for various number of factors for cross-validated brightener concentrations (scan dq21cu, channel 2, range 670-765) and carrier concentrations (scan dq21s4, ch 5, range 440-470).



Figure 6a Exner  $\psi$  function (Equation 29) calculated for the same concentration data as that of Figure 4a.



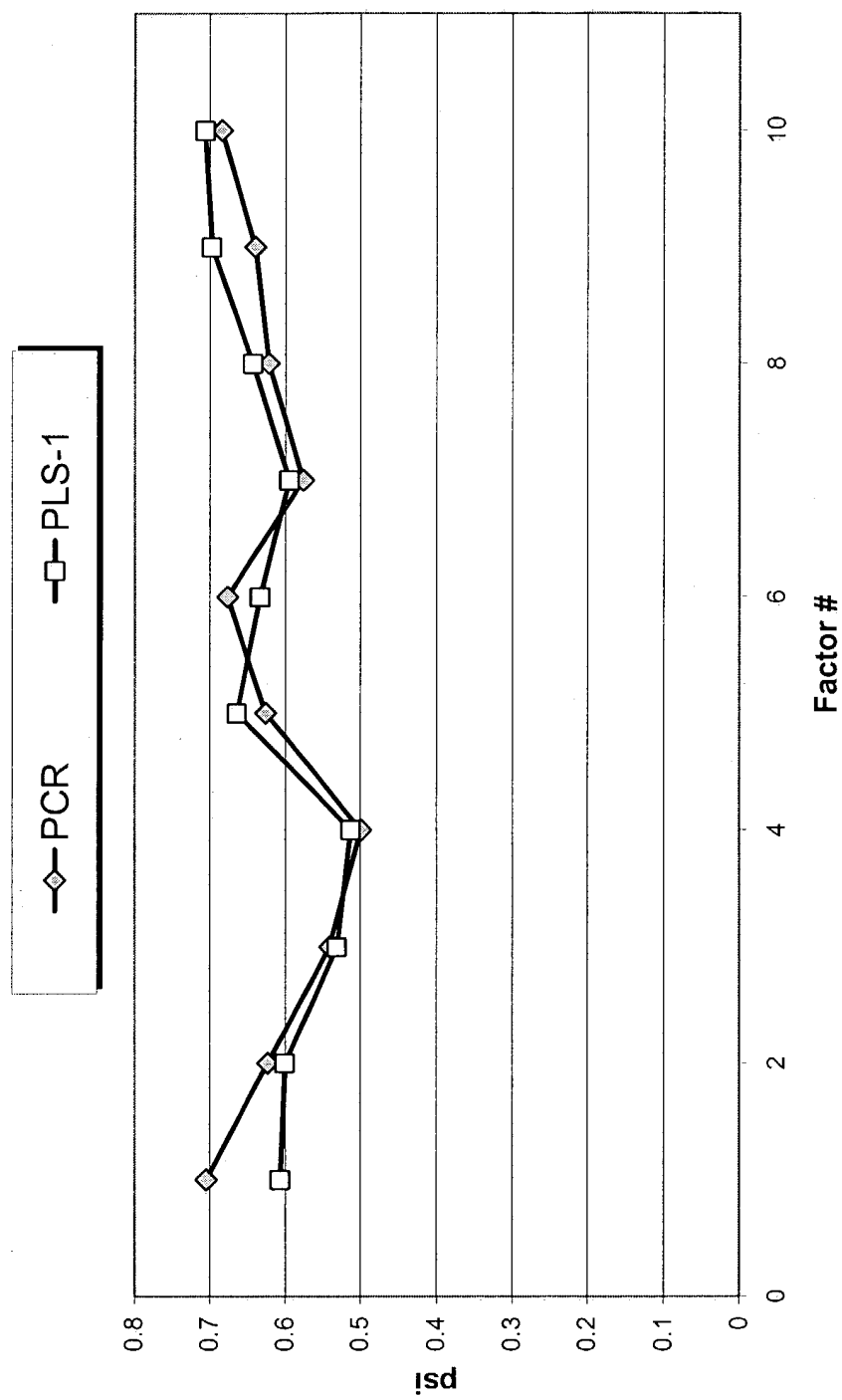


Figure 6b. Exner  $\psi$  function (Equation 29) calculated for the same concentration data as that of Figure 4b.

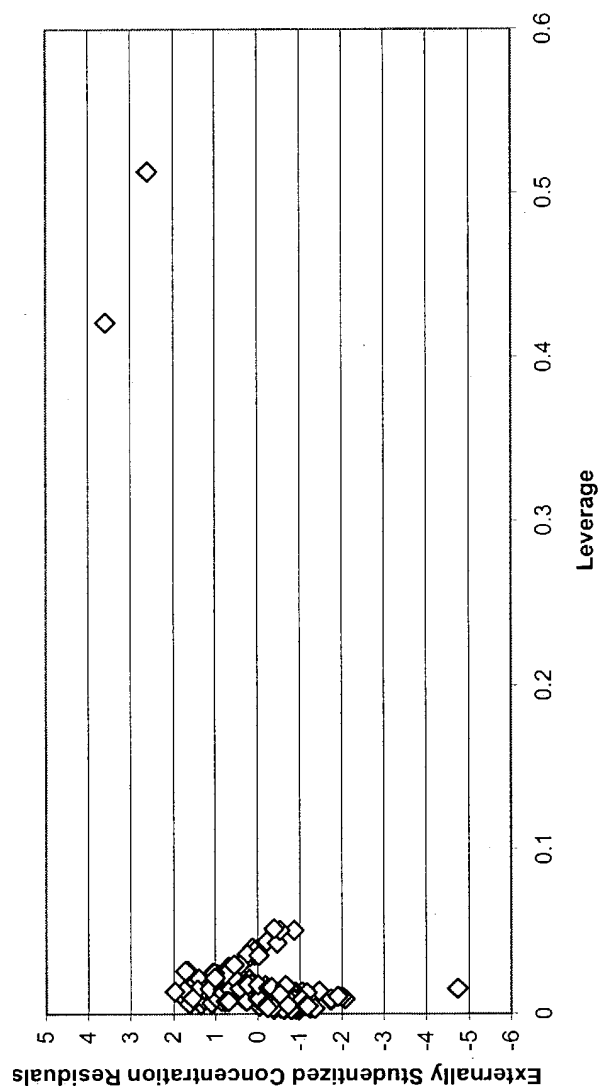


Figure 7. Plot of leverages versus externally Studentized concentration residuals for brightener (scan dq21ba2, channel 5, range 300-860, 4 factors).

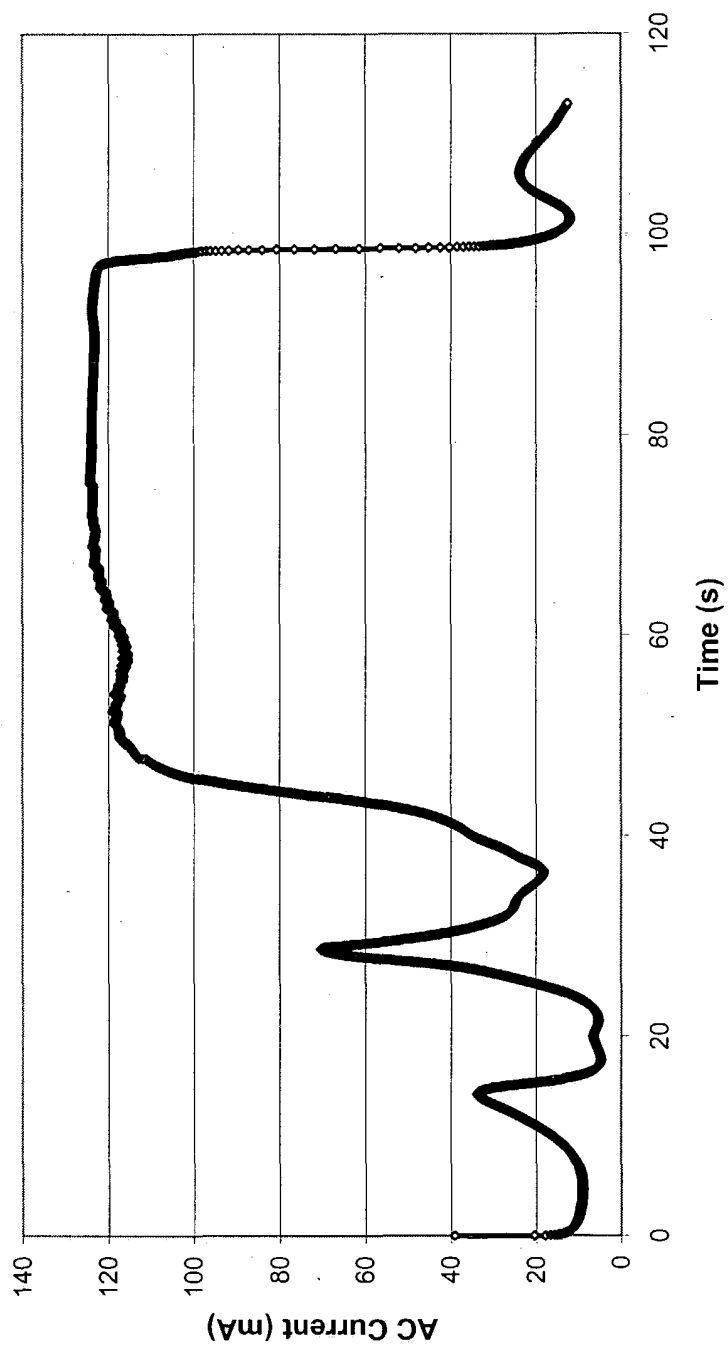


Figure 8. An example cyclic AC (X first harmonic) voltammogram scan dq21b26, ch3 for PC75 plating bath.

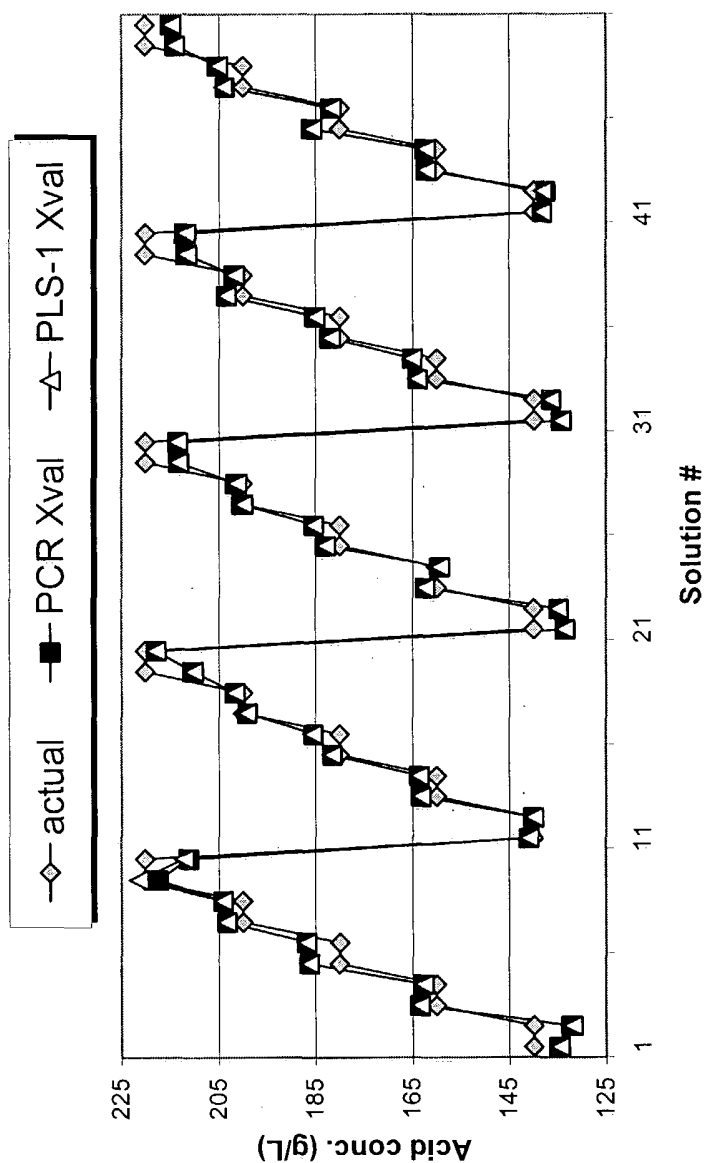


Figure 9. Actual (blue) and crossvalidated by PCR (green) and by PLS-1 (red) acid concentration values for PC75 plating bath calibration; scan dq21b26, ch 3, range 4000-4800, 3 factors.

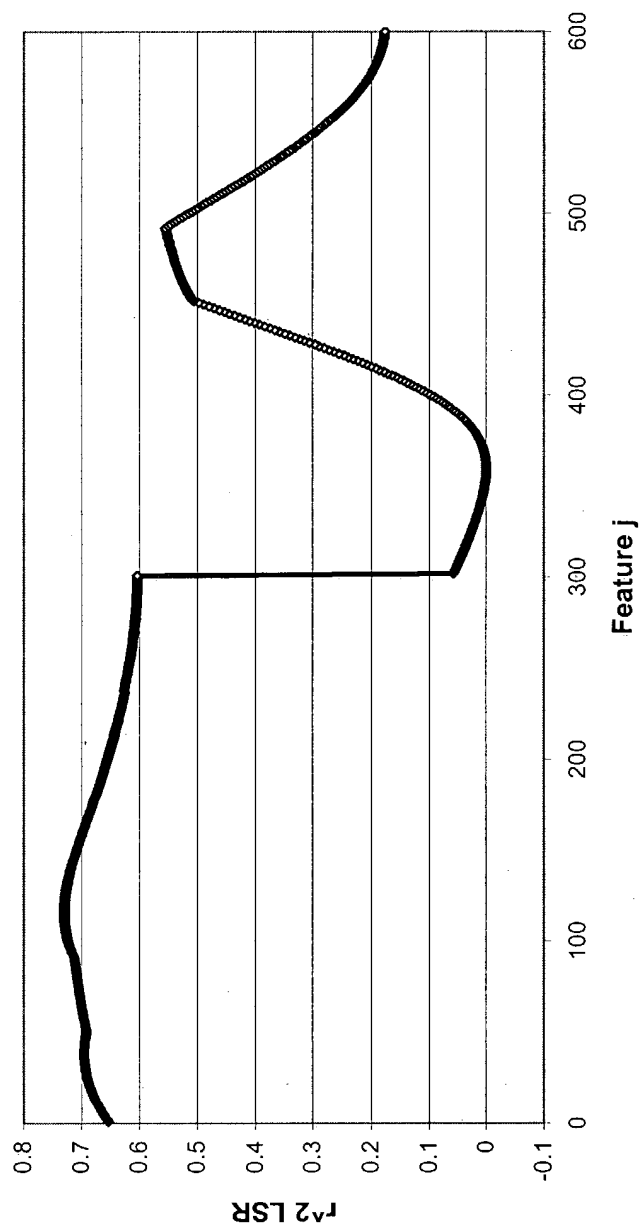


Figure 10.

The squared correlation coefficients (Equation 36),  $(r^0)^2$ , for selfpredicted brightener concentrations. PC75 plating bath calibration obtained via least squares regression for part of the scan dq21ba2, channel 3, range 401-701 (first 301 points) glued with scan dq21ba2, channel 4, range (301-601) (last 301 points).

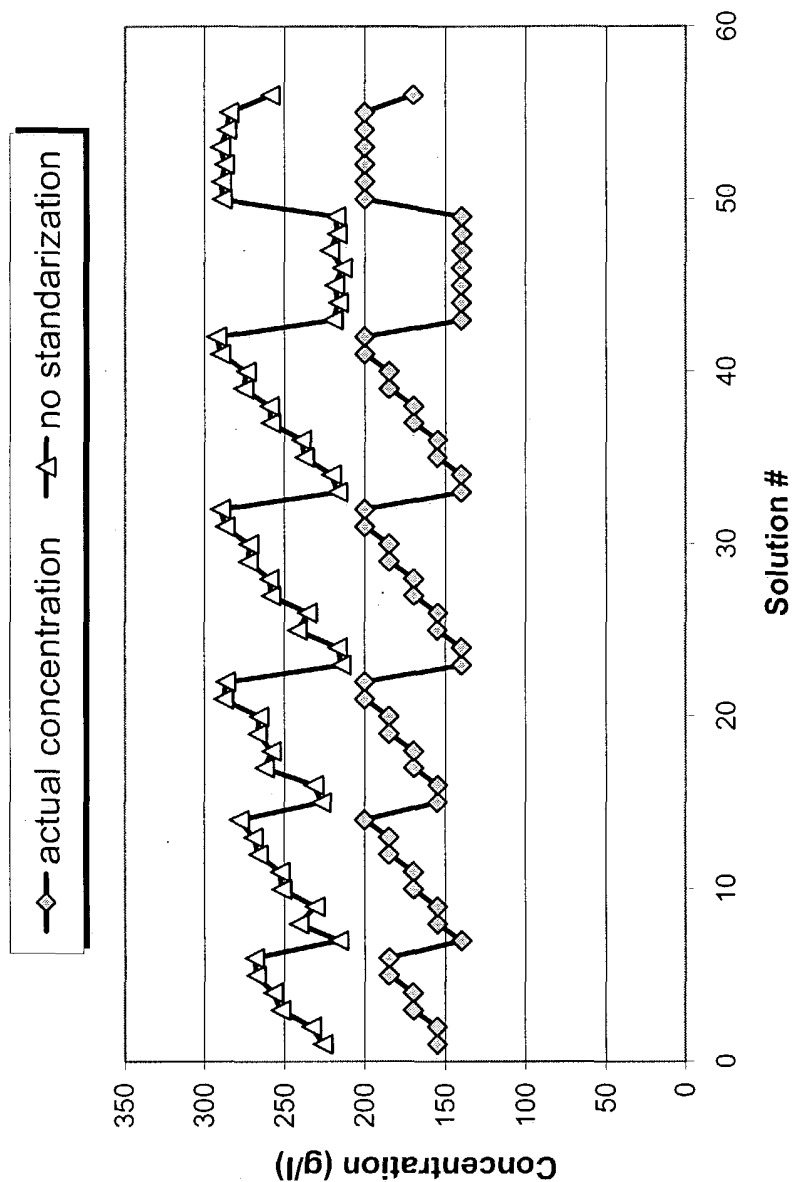


Figure 11a. Prediction of acid concentration on the secondary instrument calculated employing regression equation from the primary instrument without any standardization (scan dq21b26, channel 3, 3600-4350, 4 factors).

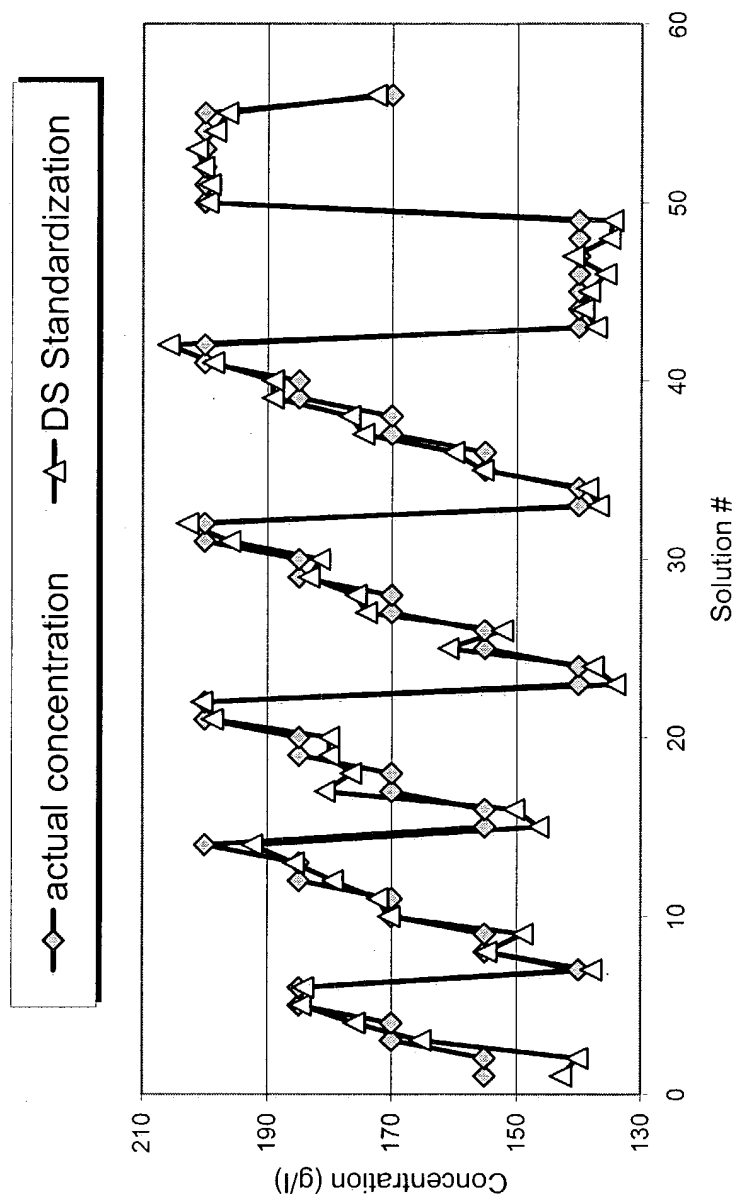


Figure 11b. Prediction of acid concentration on the secondary instrument calculated employing regression equation from the primary instrument standardized with DS (scan dq21b26, channel 3, 3600-4350, 4 factors).

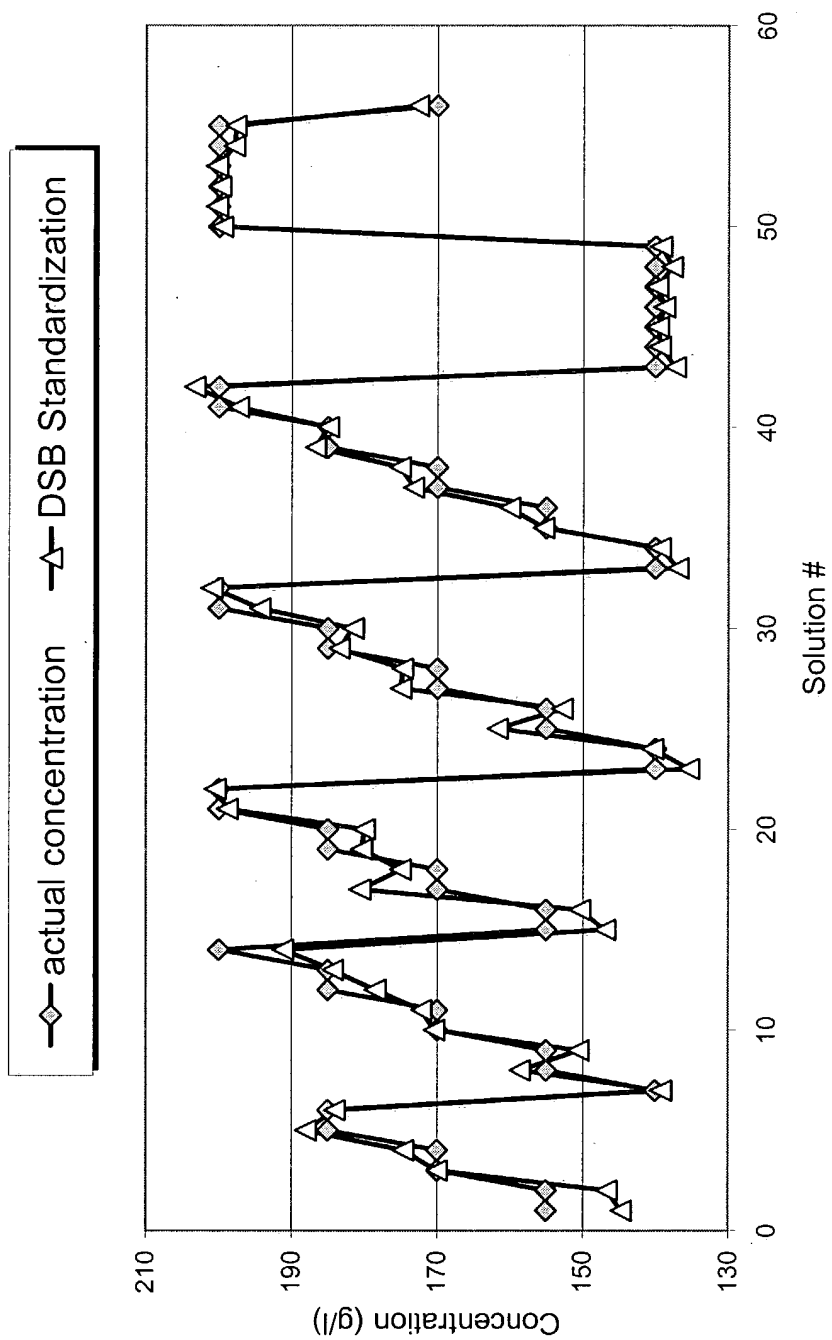


Figure 11c. Same as Figure 11b but standardized with DSB.



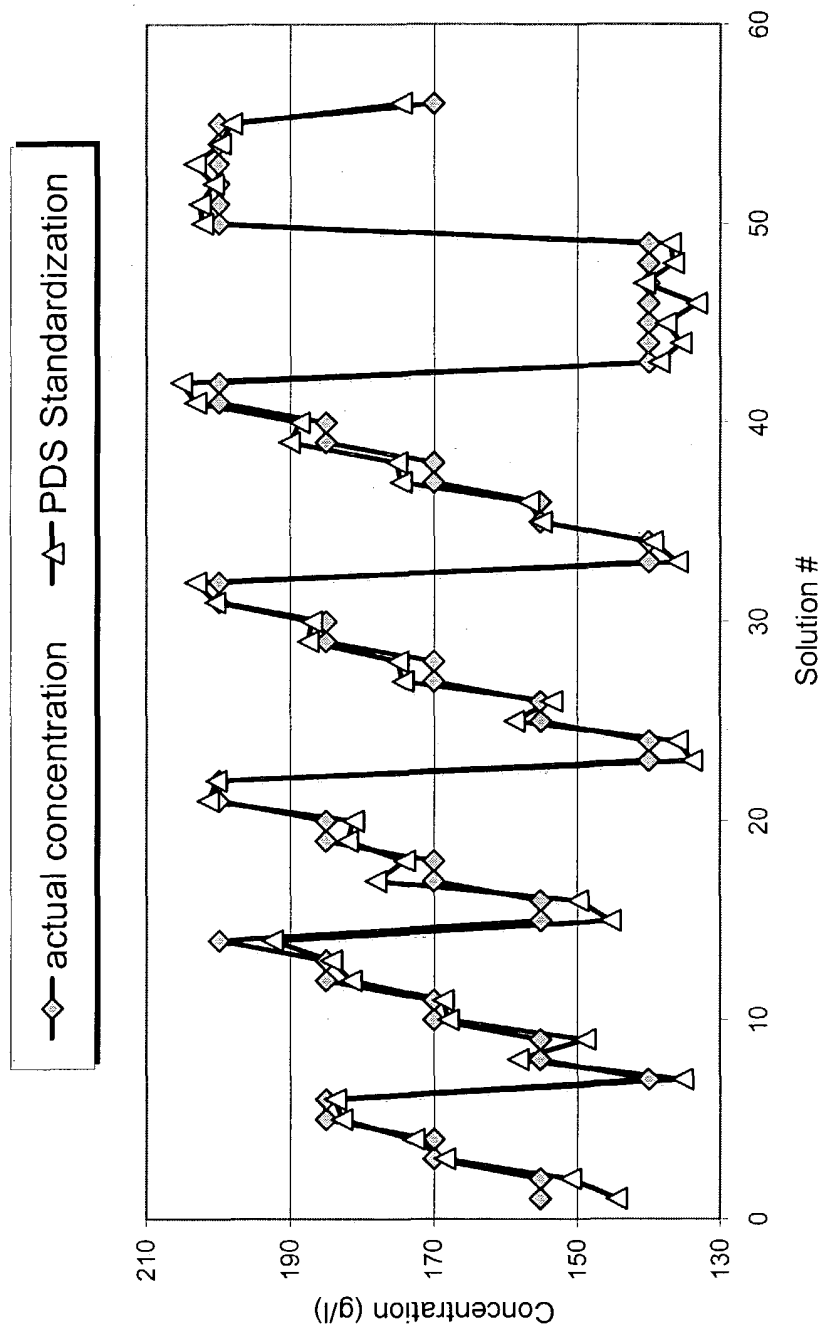


Figure 11d. Same as Figure 11b but standardized with PDS.

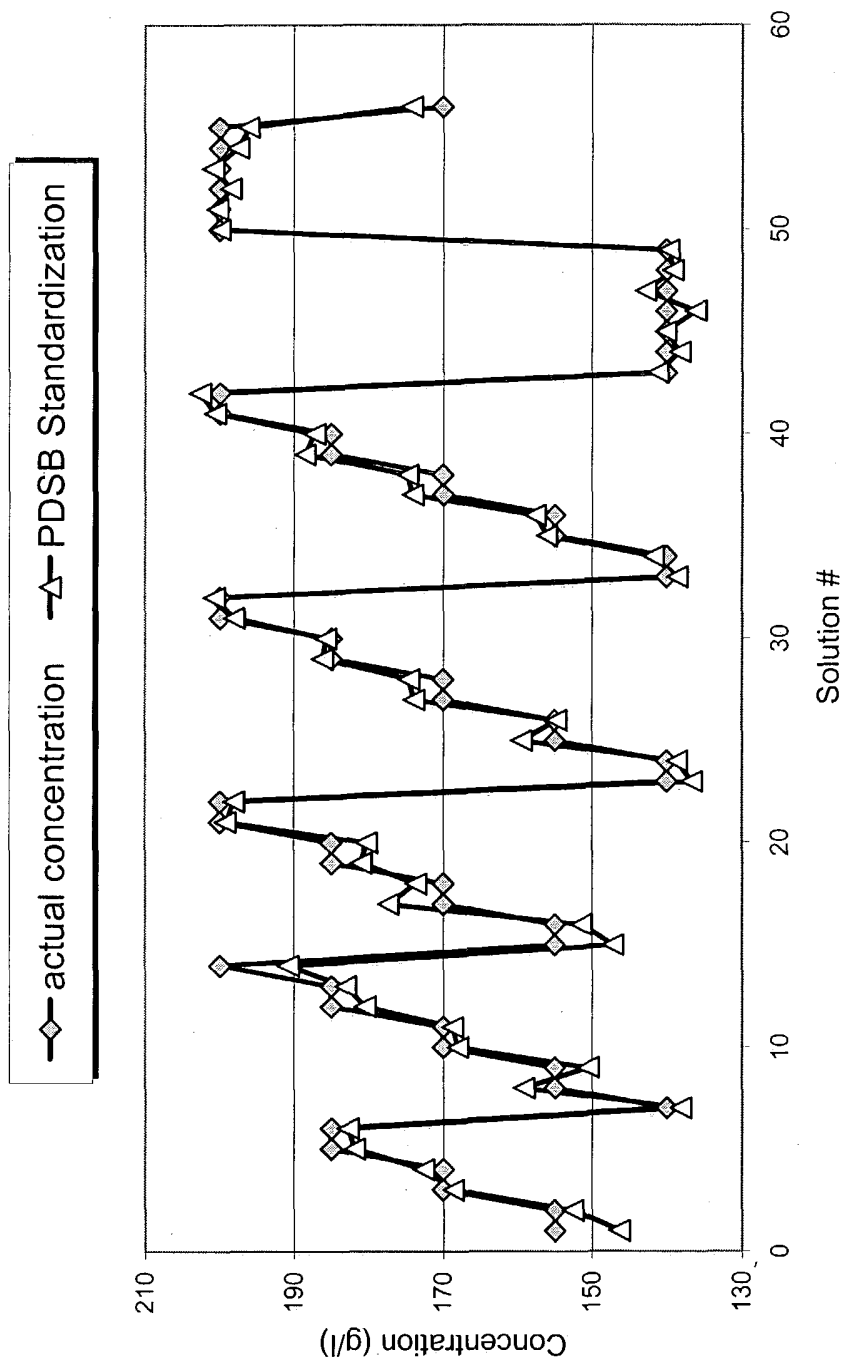


Figure 11e. Same as Figure 11b but standardized with PDSB.

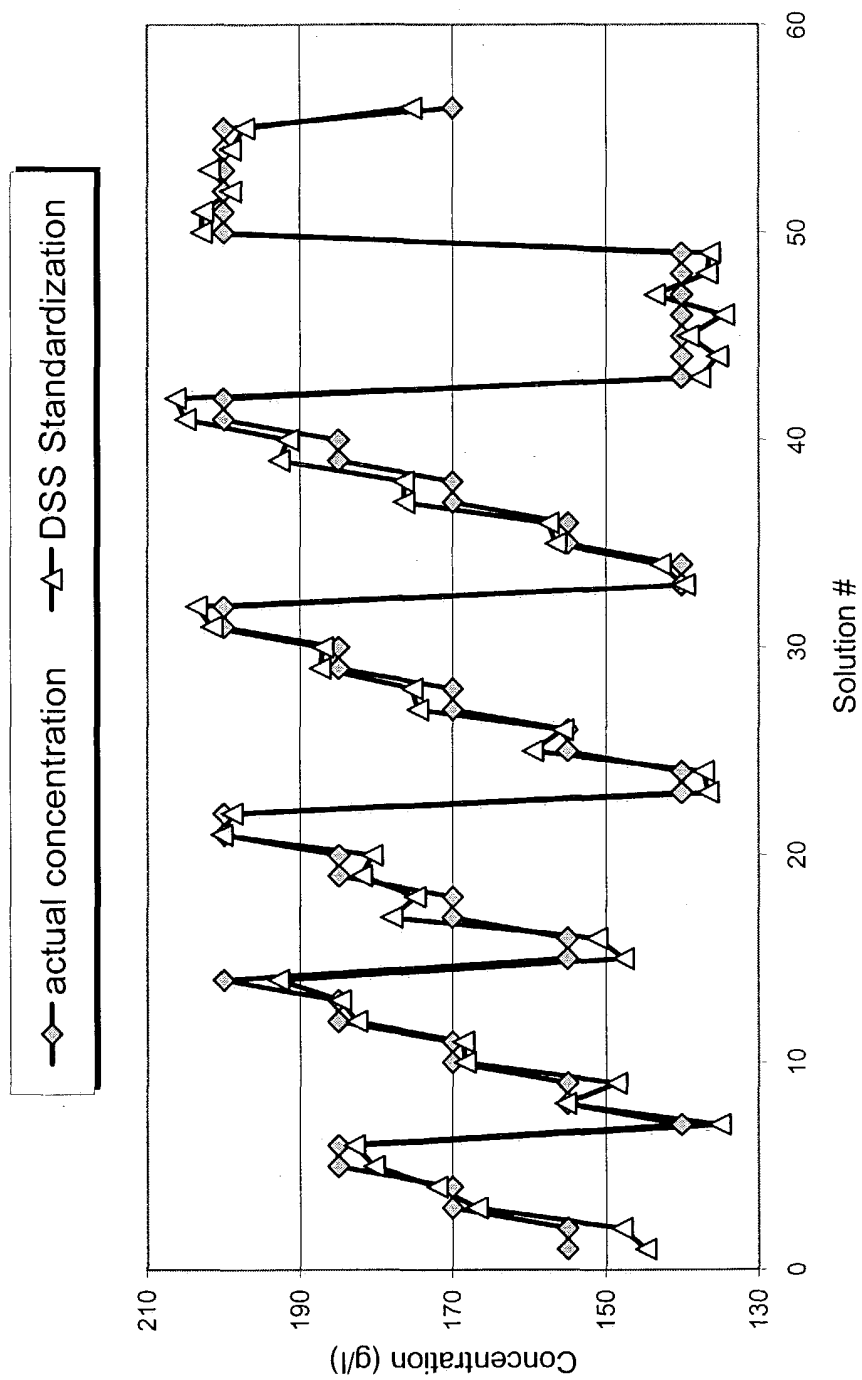


Figure 11f. Same as Figure 11b but standardized with DSS.

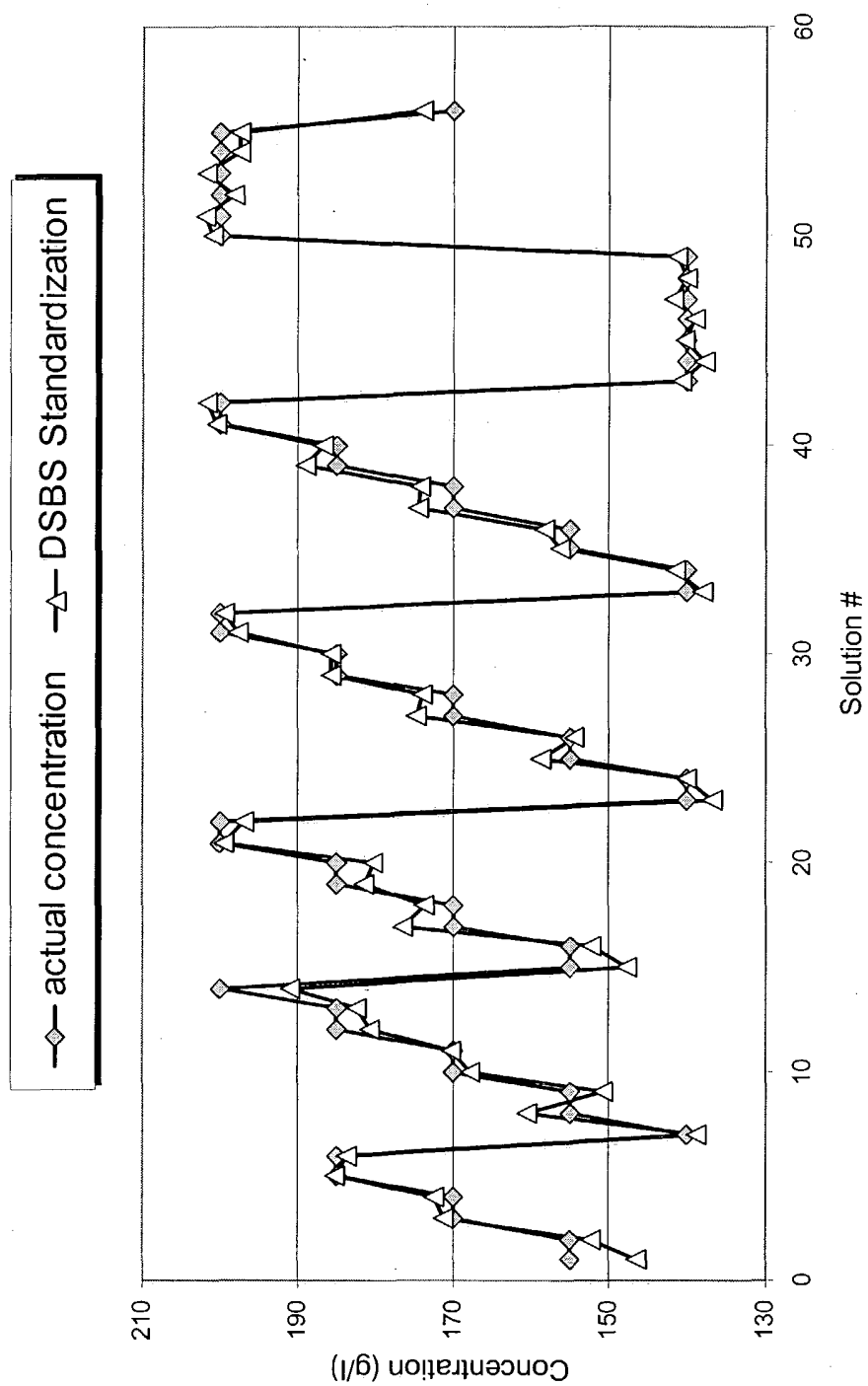


Figure 11g. Same as Figure 11b but standardized with DSBS.